Answer on Question #63767 - Chemistry – General Chemistry

Silver (I) oxide (Ag_2O) decomposes completely at temperatures in excess of 300°C to produce metallic silver and oxygen gas. When 1.6 grams of impure Ag_2O is decomposed and allowed to cool to STP, the reaction is found to yield 72.1 mL of oxygen gas. What is the percentage of Ag_2O in the original impure sample?

Solution.

$2Ag_2O \rightarrow 4Ag + O_2\uparrow$

$M(Ag_2O) = 108\times2 + 16 = 232$ g/mol

2×232 g Ag_2O – 22.4 L O_2

x g Ag_2O – 0.0721 L O_2

$x = 0.0721\times2\times232/22.4 = 1.5$ g Ag_2O

$w(Ag_2O) = 1.5/1.6 = 0.9375$

$w(Ag_2O) = 0.9375\times100 = 93.75\%$

Answer: $w(Ag_2O) = 93.75\%$